volume of nearly 500 pages has been beautifully printed at the Cambridge University Press, and is one that will be a most handy work of reference to all students. In a short preface the author apologises in advance for possible deficiencies. It would be impossible to have a work of this sort free from omissions; but we have gone over very carefully the portion of the bibliography with which we were most familiar, and have been very much struck with its extreme accuracy. It is proposed to publish in the course of 1886 a supplement, to contain all detected omissions, and the author will gratefully receive any additional titles that may be sent to him. We would suggest that it might not add too much to the labour of preparing this, and that it would certainly add to the value of the supplement if omissions in Carus's volumes were also taken notice of, so that the bibliography of the groups now catalogued by Mr. D'Arcy Thompson should be fairly complete. This has been, we notice, already done in some instances in the volume before us. An index of authors' names would also be of use.

On the Ethics of Naturalism. (Shaw Fellowship Lectures, 1884). By W. R. Sorley, M.A. (W. Blackwood and Sons, 1885.)

THE theory of evolution has established its claim to having given the most satisfactory account of all forms of natural life, and Mr. Sorley endeavours here to show how it yields, by advancing it a step further, a complete explanation of human nature, mental as well as physical.

Whence, then, do human rules of action and aspirations for future right conduct come, and what sustains them? Mr. Sorley points out that happiness cannot *explain* the definite end of human action; it is only another name for it. Education and legislation combine to make the greatest happiness of the greatest number the desirable thing for each man's actions to tend towards, but there is little difficulty in pointing out the weakness of the theories of earlier writers who have tried, without the help of Darwin, Spencer, Galton, and others, to explain the feeling of duty; the feeling that we *ought* to do one thing rather than another when the former does not at the time seem so agreeable. We may quote Hobbes, for instance, who is unable to explain why any man feels any *duty* to his neighbour, and invents the fiction of the 'social contract"; and Prof. Bain, who has to account, by the associations of a few years, for the harmony of feeling between the individual and the whole. Evolution, of course, explains that although in the earlier days of the human race, each beneficial action sprang from egoistic motives, yet that the good result to the society has led to an inherited sympathy with such actions and such actors. There is the difficulty that since present ideas, according to the doctrine of evolution, are the latest outcome of all past experience, and what we are is the last result of all past influences, we seem to arrive at the very unprogressive conclusion that whatever is is right. And if, indeed, each man found that he had arrived at perfect harmony with all his surroundings, this would be the ideal state. This, however, is the case with none of us. Few of us but find the well-known utterances of the former and the "Video meliora, proboque, deteriora sequor" of the latter the counterpart of our own experiences, and still more easy is it to see how far from the present accepted ideals are all our neighbours. But as among all the slightly differing variations of a species there is a tendency to return to one type, so among all the contending inclinations and dispositions of the members of a race there abides an inherited code of morality, now become instinctive; one, as nearly fixed in each individual as the form of any species, but, like that, varying and developing in different individuals, families, and nations, and adapting itself to changed surroundings. These surroundings have always in human history been so different that the inborn or ideal code has not at any time become a general, still less a universal, one, and the struggles after holiness of the Hebrew, after beauty of the Greek, and after justice of the Roman, are still being continued in various proportions as modern times and conditions of existence have altered.

To some a morality never to be fixed will not appear a very steady one; a morality that is calculated to vary at different epochs and in different climates. Yet, surroundings always changing, man has to adapt himself to the change; always, therefore, will he be labouring towards a changed goal. Neither is it a cheerful prospect for the race. There will always be the "necessity for strong egoistic feelings and conduct in the struggle for existence, where the better-equipped organism asserts and maintains its supremacy only by vanquishing the organisms which are not so supplied." This struggle will continue on the highest levels of progress to which our race will reach; for "the multiplication of desires and of desiring individuals keeps so well in advance of the means of satisfying desires, that it is doubtful whether the course of evolution is fitted to bring about complete harmony between different individuals. It would almost seem that the 'moving equilibrium' in human conduct in which there is no clash of diverse interests cannot be expected to be brought about much before the time when the physical factors of the universe have reached the stage in which evolution ends."

Clark's Transit Tables for 1886. (London: E. and F. N. Spon, 1885.)

MR. LATIMER CLARK is still faithful to his self-imposed duty of enabling any one to obtain accurate time in any part of the world by means of the transit instrument, without any calculation. As in former years, Mr. Latimer Clark has now computed from the *Nautical Almanac* all the data necessary to enable this to be done for 1886. The author is doing a good work, for which every student of astronomy should thank him, for we have little doubt that most of those who procure a little transit instrument, and work it under Mr. Clark's able direction, will not end there.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

The Late Total Eclipse

ALLOW me to call the attention of such of your readers as are not already aware of the fact that the phenomena I mentioned in my notes of the late eclipse—the "pulsation" of the sun's light just before totality and the simultaneous "wave-shadows"—are recorded by Grant ("Hist. of Phys. Astronomy," p. 404) as having been witnessed in France during the total eclipse of 1842. He mentions several probable causes or contributing causes; among them the unsteadiness of the air, which certainly existed here. I have not been able to find these phenomena (or phenomenon with a double aspect) mentioned in any other work accessible to me, and should be obliged to you for a statement of the explanation now received. To an outsider the (apparent) rarity and local character of the phenomenon seem to cause this difficulty:—If it is owing to any cosmical cause, or one common to any large part of our atmosphere, it would seem that the phenomenon should be more widely seen; if, on the other hand, it is owing to the unsteadiness of the observer's atmosphere, should it not occur oftener?

Allow me to add that in suggesting in my notes that the small prominences I saw were "Baily's Beads" I was writing ignorantly, having been long under the impression that Baily's

Beads were a phenomenon of totality, and coloured; a reference to an elementary work showed me my error. What I saw was a row of small similar-looking and about equidistant prominences of a faint pink colour. A. S. ATKINSON

Nelson, N.Z., November 13

Brilliant Meteor

I CAN confirm Mr. M'Keague's statement regarding an extremely brilliant meteor observed by him on November 27, the train of which remained visible for fifteen minutes, for about 6 o'clock the same evening I saw, when near Edinburgh, the train of one very bright meteor (brighter than Venus) last for at least ten minutes. I did not time it exactly, but it could not have been less than that, and while it remained visible it kept curving round, and diffusing itself out into a thin cloud. About half an hour later I saw the train of another very bright one remaining and behaving similarly for about five minutes.

Broxburn, December 18 JOHN STEVENSON

Models Illustrative of Phyllotaxis

PROF. PARKER'S note upon this subject induces me to mention a rough-and-ready contrivance, which I found serviceable when lecturing on this subject. This consisted merely of the framework of a collapsible opera-hat, or of two or three superposed. It is easy to attach stiff labels to these in any desired order, and easy to illustrate undeveloped or developed internodes, as the case may be. I have used the joints of an old telescope for similar purposes. Of course these are "make-shifts" only, but they are available when better things are not at hand. MAXWELL T. MASTERS

The Viper (*Vipera berus*, L.)

THE following letter, addressed to me by a most intelligent farmer, may be thought worthy of publication, as furnishing an additional item of evidence on a much-debated question.

"*Church Dale House, Egton, Grosmont, Yorkshire, November* 10, 1885

"DEAR SIR,—In the beginning of the harvest of 1878 or 1879 I was with my late father, Mr. Thomas Stanforth, of Howlsike, near Lealholm, North Yorkshire, in a corn-field on the Howlsike Farm, when we noticed a large viper in a rough part of the field. My father exclaimed, 'Hold on, there's a hagg-worm,' and just at that moment the viper moved its head and hissed, when we both saw some ten or twelve young vipers glide into the mother's mouth. My father immediately crushed the head of the animal with his heel, and we laid it on a stone wall, intending to open it at our leisure. Proceeding to our work, this was forgotten, and I did not again see the viper until the following winter, when I found it still lying on the wall, but reduced to a skeleton. I examined it closely, and found many small perfect skeletons inside the larger one.

"In the summer of 1865 I saw a large viper opened, and a full-grown skylark taken out of its stomach.

"Yours truly,

(Signed) "ROBERT STANFORTH"

Much circumstantial evidence has already been printed on this alleged habit, and it is not unreasonable to suppose that the young reptiles, when disturbed, will rush into the nearest opening that presents the appearance of a place of refuge; but I do not remember to have seen any proof of the viper returning her young to liberty when the supposed danger was past. If they merely lodge in the gullet they can doubtless be ejected at will; if they pass into the stomach, their uneasy motions may act the part of an emetic, and produce nausea and vomiting before asphyxia sets in or digestion begins; and in either of these cases the action of the mother in permitting her brood to enter her mouth may be regarded as voluntary and instinctive. It is, however, possible that the young vipers may dart, uninvited, into the parent's mouth when it is opened in the act of hissing, and that they may quickly perish and be converted into food. We can only repeat the words of the late Prof. Bell, F.R.S., written thirty-six years ago:—"In this state of doubt upon so interesting a subject, it is perhaps better to await the results of direct experiment, which might be readily made in any locality where these reptiles abound" ("British Reptiles," 2nd edition, p. 69). R. MORTON MIDDLETON, Jun.

Castle Eden, December 10

Ventilation

MR. FLETCHER, of Warrington, ought to be an authority on such a matter as ventilation, and probably he has omitted in his letter to you some material points. I should like to know something of the supply of fresh air to the rooms where the ventilation failed. If that was abundant, then, it seems, there should have been an up-draught in each flue, though, as the current in the ventilating flues would have been less than in those of the chimneys, it would have been better if possible to have their outlets a little separate. If, however, the supply of air to the rooms were insufficient for the joint draught, then the ventilating flue (so called) would have become a down-cast shaft, and (owing to its situation) would have brought down smoke, &c., as described; and this insufficient supply, when the fires were lit and the ventilation shaft heated, might have been quite enough when there was no fire, or the chimney might have been the down-cast.

It has always seemed to me that this matter of air-supply is at the bottom of ventilation failures. The amount required is so large, that it must be warmed before entering a room in winter, but there are few houses where any provision is made for this. In fact, as matters stand, it seems to me that it would be nearly impossible to make satisfactory arrangements in most cases without great expense. No doubt the best arrangement would be to warm all the air, in one place, before entering the house, and to employ the fires or stoves in the rooms only to give locally greater warmth or brightness; but such an arrangement is so un-English that I suppose it must be rejected. Because our forefathers, when they first roofed themselves in, transferred their fire from the forest or cave to the middle of the hall, and then to the side with a chimney, we must follow the same practice; meanwhile closing up the inlets, which were plentiful enough in the early arrangement. We may be Radicals, but, like our ancestors, in most things, we do not wish to change the laws of England. J. F. TENNANT

37, Hamilton Road, Ealing, W., December 18

Snails Eating Whitening

I DO not know if the observation which is recorded below is new, but it is certainly new to me, and seems to be sufficiently interesting for publication. In the autumn of 1884 I noticed that the whitening which had been painted on some greenhouse glass in a garden at Reading, had evidently been eaten off by a large Gasteropod. The whitening was almost entirely removed from one pane, and partially from many others. The outlines of the parts which had been eaten were quite unmistakable, exactly resembling on a large scale the well-known traces left by freshwater snails on the conferva-covered glass of an aquarium. I did not find the snails at work, but the gardener assured me that he had seen them upon the glass, and that they were the common garden snails (*Helix aspersa*). Considering the entirely characteristic appearance of the marks, I think it may be taken as proved that the whitening was eaten by some large Gasteropod, and almost certainly by *Helix aspersa*. It is exceedingly probable that other forms of calcium carbonate (especially limestone rocks) are eaten in the same way, but the conditions of this particular form of the substance—spread out as it was in a thin film on a transparent layer—rendered the fact that it had been eaten especially conspicuous. As to the importance of calcium carbonate to the snail, it must be remembered that there is not only the necessity for growth of the shell in the young animal, and its repair in the adult; but there is also a regular periodical need in the latter for material to supply the place of the calcareous dart (*spicula amoris*), which is discharged before coitus, and is believed to act as an excitant in the sexual relations of these animals. The membrane (hibernaculum) which closes the mouth of the shell in winter is also to some extent calcareous.

December 14 EDWARD B. POULTON

Blackbird with White Feather

THERE is about my garden a hen blackbird with a white feather in the tail. I do not know whether this variation has been noticed before.

JOSEPH JOHN MURPHY

2, Osborne Park, Belfast, December 21